

**TYPHLOIULUS SERBORUM N. SP., NEW CAVE-DWELLING DIPLOPOD FROM SERBIA
(MYRIAPODA, DIPLOPODA, JULIDAE)**

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Abstract. The new species of cave diplopod *Typhloiulus serborum* n. sp. is described as new to science, thoroughly illustrated, and diagnosed. The phylogeny of the genus *Typhloiulus* Latzel is briefly discussed.

Key words: Diplopoda, Julidae, *Typhloiulus*, new species, phylogeny, Serbia

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INTRODUCTION

The genus *Typhloiulus* Latzel, 1884 includes 33 species, most of which are more or less pallid. Almost all eyeless, they are often long-legged and sometimes have strongly modified mouthparts (Maurès *et al.* 1997). The core of species ranges from Northern Italy and Slovenia in the west to Croatia, Bosnia and Herzegovina, Hungary, Serbia and Montenegro, Macedonia, Albania, Romania, Bulgaria, and the Greek mainland in the east and south.

According to Makarov *et al.* (2004), in the territory of Serbia and Montenegro only three species of this genus are known: *Typhloiulus albanicus* Attems, 1929, *T. strictus* (Latzel, 1882), and *T. nevoi* Makarov, Mitić & Ćurčić, 2002.

In the present paper, a new species of the genus *Typhloiulus* is described. The holotype male and paratype male are deposited in the collection of the Institute of Zoology, Faculty of Biology, University of Belgrade, Serbia and Montenegro.

SYSTEMATIC PART

Julidae Leach, 1814

Typhloiulus Latzel, 1884

Typhloiulus serborum Ćurčić & Makarov, n. sp.
(Figs. 1-4)

Material examined. Holotype male and paratype

male, from the Izvidjačka Pećina Cave, village of Suva-ja, Resava River, Eastern Serbia, 2.07.1992-5.07.1992; collected by Ivo Karaman.

Etymology. After the Serbs, local inhabitants of the area studied.

Description. Coloration yellowish, without eyes. Body with 51 pleurotergites + telson (two apodous pleurotergites). Body length 29.25 mm (holotype male); Hmax 1.625 mm (holotype male). Head with two occipital setae, glabrous. Labrum with three median teeth, 14-15 labral and 4-5 supralabral setae. Promentum elongated, triangular, almost twice shorter than lamellae linguales. Stipites with three apical setae and 3-4 median setae, each. Lamellae linguales each with 4-5 setae arranged in one row.

Length of antennae 2.40 mm (holotype male); distance between antennal sockets 0.48 mm. Length of antennomeres I-VII (in mm): 0.25 (I), 0.45 (II), 0.45 (III), 0.40 (IV), 0.35 (V), 0.30 (VI), 0.12 (VII), and 0.08 (VIII). Length/breadth ratio of antennomeres I-VII: 1.00 (I), 2.25 (II), 2.14 (III), 1.18 (IV), 1.40 (V), 1.50 (VI), and 0.80 (VII). Antennomere V with a terminal corolla of 22 sensillae arranged semicircularly; antennomere VI with a corolla of 16-18 sensillae arranged almost circularly; antennomere VII anteapical with thickened field of minute setae.

Collum two times broader than following pleurote-

rgites and with posterior row of 16-18 setae. Metazonites with 26-28 setae (on midbody somites); maximal length of setae 0.35 mm (in holotype male). Surface of metazonites gently striated (striae almost disappearing on last few somites). Suture between pro- and metazonites clear; ozopores lying behind constriction. Male pleurotergum 7 with a wider and rounded distomarginal tooth.

Epiproct long, slightly curved ventrally; paraproct with five rows of setae (marginal row with 30 minute setae, each of three median rows with six long setae, inner row with 2-3 setae). Hypoproct subquadrangular, with apical row of 6-7 setae.

Length of midbody legs 1.43 mm. Male legs 1 hook-shaped (Fig. 2). Coxa I, prefemur I, femur I, and postfemur I with one, five, four, and one setae, respectively. Tips of hooks elongated and tuberculated on their inner side. Penis bilobed (Fig. 3).

Gonopods. Promerite spatulate; parabasal internal lobe reduced; parabasal external lobe (telopodite) small, almost parallel-sided with outer promerite margin (Figs. 1, 4). Flagellum appears in the base of the promerite.

Mesomerite on lateral side rather sigmoid (Fig. 1), mesally bi-lobed (Fig. 4). Uppermost lobe almost spherical and in connection with opistho-mesomeral lamella. Basal lobe small, finger-like, recurved mesally.

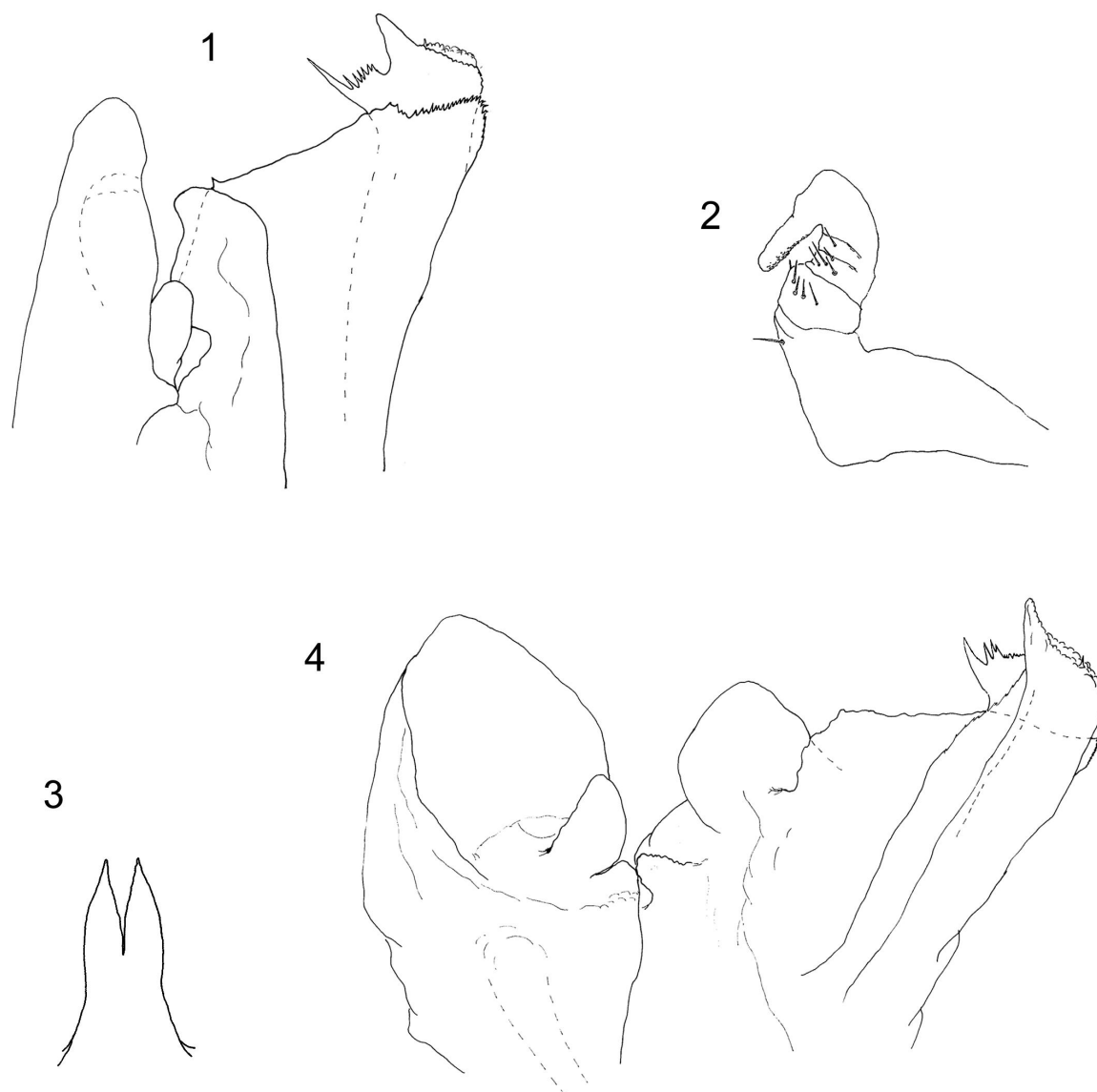
Opisthomerite almost parallel-sided. Solenomerite elongated in the long lobe with flagellar opening. Velum similar to that in other congeners, with dentate margin and long apical thorn (Fig. 4). Opisthomerite and mesomerite in clear connection through massive lamella (Figs. 1, 4). Lamella starting in the base of uppermost mesomeral lobe, surrounding opisthomerite on lateral side and finishing subapically on caudal side of solenomerite.

Diagnosis. The new species is closely related to *Typhloiulus strictus* (Latzel, 1882) but differs in many important respects, such as: number of supralabral setae (4-5 *vs.* six); number of labral setae (14-15 *vs.* 17-20); shape of ventral margin of seventh male pleurotergites (rounded *vs.* subquadrangular); shape of parabasal external lobe (straight *vs.* curved); absence/presence of setae on tip of solenomerite (absent *vs.* present); and shape and size of lamella (clearly connecting opistho- and mesomerite *vs.* only in connection with mesomerite).

DISCUSSION

The new species has some features showing possible in evolution of the gonopods in *Typhloiulus* *sensu lato*. In *T. serborum* n. sp., a clear connection exists between the opisthomerite and mesomerite through a massive lamella. Some other typhloiulines also have a lamella (*T. strictus*; *T. albanicus* Attems, 1929; *T. incurvatus* Verhoeff, 1899), but in those representatives the mesomerite is an independent branch (Makarov *et al.* 2002). Some species have a lamella connecting only with the opisthomerite (*T. hauseri* Strasser, 1974; *T. bureschi* Verhoeff, 1926; *T. incurvatus*; *T. giganteus* Čurčić and Makarov, 2002), a lamella connecting only with the mesomerite (*T. strictus*), or even one that appears as an independent branch between the opisthomerite and the mesomerite (*T. albanicus*, *T. nevoi* Makarov, Mitić and Čurčić, 2002). The new species is at the moment the only representative of the genus *Typhloiulus* with a unique opistho-lamello-mesomeral complex. It is pertinent to note that in all the above-mentioned species, a well-developed velum exists. If we accept Enghoff's (1987) opinion that "...in higher julids... the mesomerital process is an independent branch...", the presence of a lamella is plesiomorphic in typhloiulines. In other words, all typhloiulines with different degrees of development of the lamella are much closer to the ancestral state than are other representatives of the genus *Typhloiulus* in which the lamella is reduced. In such a case the genera *Lamellotyphlus* Tabacaru, 1976 (in which the mesomerite and opisthomerite are fused), and *Banatoiulus* Tabacaru, 1989 (in which the mesomerite is reduced) are among candidates for the "ground-plan" of all typhloiulines. It should be noted that similar phylogenetical trends also appear in some other julids; for example, this is the case in Oncoiulinae, in which the mesomerite and solenomerite are also connected through a lamella, but the velum is reduced or actually represents a lamella (Enghoff, 1987; Tabacaru and Gava, 1992). Does this mean that few independent phylogenetic lineages exist in typhloiulines, or do we have here an example of convergency, divergency or even parallelism? Further confusion arises with the speculation of Mauriès *et al.* (1997) that a large tribe Leptoiulini exists in the Balkans and "... there are no apomorphies whatever in typhloiulines which would distinguish them from the sympatric yet somewhat more widely distributed, Euro-Mediterranean tribe Leptoiulini."

At the moment, it is impossible to solve this prob-



Figs. 1-4. *Typhloiulus serborum* Ćurčić & Makarov, n. sp., holotype male, from the Izvidjačka Pećina Cave, village of Suvaja, Resava River, Eastern Serbia. 1 - gonopods, mesal view, 2 - first leg-pair, caudal view, 3 - penis - caudal view, 4 - gonopods - lateral view.

lem. We think that is first of all necessary to explore the poorly known millipede fauna of the Balkan Peninsula much better and wait until the probably numerous new species of both epigeal and hypogean millipedes are adequately documented and described.

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REFERENCES

- Enghoff, H. (1987). Revision of *Nepalmatoiulus* Mauriès 1983 - a Southeast Asiatic genus of millipedes (Diplopoda: Julida: Julidae). *Courier Forsch.-Inst. Sencken.* **93**, 241-331.
- Makarov, S. E., B. P. M. Ćurčić, V. T. Tomić and A. Legakis (2004). The Diplopods of Serbia, Montenegro, and the Republic of Macedonia. Monographs, Vol. IX, Institute of Zoology, Belgrade, 1-440.

Makarov, S. E., B. M. Mitić, S. B. Ćurčić (2002). On two new cave diplopods from Serbia (Diplopoda, Julida). *Israel Journal of Zoology* **48**, 235-242.

Mauriès, J. - P., S. I. Golovatch, P. Stoev. (1997). The millipedes of Albania: recent data, new taxa; systematical, nomenclatural and

faunistical review (Myriapoda, Diplopoda). *Zoosystema* **19**, 255-292.

Tabacaru, I., R. Gava. (1992). Une nouvelle espèce du genre *Typhloiulus* Latzel, 1884 (Diploda, Julida) de Roumanie. *Travaux de l'Institut de Speologie "Emil Racovitza"*, **31**, 53-64.

***TYPHLOIULUS SERBORUM* N. SP., НОВА ВРСТА ПЕЋИНСКИХ ДИПЛОПОДА ИЗ СРБИЈЕ (MYRIAPODA, DIPLOPODA, JULIDAE)**

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У узорку диплопода из Извиђачке пећине у долини Ресаве, описана је за науку нова троглобионтска стонога *Typhloiulus serborum* n. sp. Дате су релевантне упоредно-морфолошке карактеристике

нове форме и извршена је компарација са најближим сродним врстама. На основу грађе гонопода анализиране су могуће филогенетске линије у оквиру тифлојулина.